Pakistan-China Regional Trade Potentials in the light of CPEC

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Abstract

Empirical strategy is twofold, first is forecast base and second is based on CR and GL index. For this purpose, we utilized the twenty one sectorial exports and imports dataset among China and Pakistan is collected from world integrated trade solution. The CPEC, designed to link Pakistan and China through rail and road network including tunnel, will provide a new era of prosperity in the region. The CPEC will supplement the benefits of both of the nations and side by side provides a new way for regional development benefitting all neighboring countries coming into the web. Most probably, it will ensure a new dimension to local trade that predict transportation infrastructure, industrial production units, decreased transportation costs, reduction in inventory cost and improved delivery time. The CPEC will also strengthen the market potential for Pakistan's exports to China in the field of agricultural products, textile, and minerals. It will further enhance the tourism flow to the Northern regions of the country. Moving ahead, the empirical findings of the study also suggest that various development strategies are emerging in the CPEC context for policy makers to optimize the logistics, transportation, trade decisions. Furthermore, the intra-regional trade estimation indicate that Pakistani economy needed to devise tax policy, tax-free zone and subsides for industrial development to compete Chinese industrial exports.

Introduction

The China-Pakistan Economic Corridor (CPEC) is designed to link Pakistan and China through rail-road network including tunnel (approximately 3000 km from Gwadar to Kashgar) will endow with a new era of prosperity in this region. The CPEC ensures far-reaching benefits not only to the member countries but will also provide a new way of regional growth all adjoining countries. The project will add value to transportation infrastructure, industrial production units, which may lead to lessening the transportation cost, reduce inventory cost and improve the delivery time. CPEC is an economic corridor is a name of good infrastructure that helps in economic activities. It will provide more employment opportunity, higher wages, and other desirable outcomes. CPEC in not only the first project of this nature rather the chain of other corridors existing in different countries, i.e. Africa specially connecting through north and South, Trans-Kalahari Corridor; North/South Corridor and East/West Corridor in Asia; Novadutra in Latin America or South America. These Economic corridors are very successful examples of economic development, poverty reduction, trade expansion, economic integration. In Asia, the trade corridor is imperative to foster trade and economic growth in order to compete other continents (McGregor, 2006). It is one of the indicators that break the stagnant of economic growth, and take hierarchy as well.

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Moving on the same lines, the government of Pakistan has started working on regional connectivity via the CPEC flanking Special Economic Zones. Pakistan's geopolitical location makes appropriate candidate for interregional trade and CPEC is very fundamental for the vision 2025. So in the context of CPEC, we analyzed the future of Pakistani trade in the world especially with Central and South Asia. We also compared the transportation cost with and without CPEC and highlight that how much beneficial for Pakistani trade and development? What benefits Pakistan expect from China if CPEC is successfully employed? Is purpose of this corridor merely to achieve the political and economic goals through trade and development? We pose these questions and try to find the answers to these questions empirically.

An important characteristic of Geo-strategically Pakistan location during the last few years has been inspiring the role of CPEC to less developed countries. Geo-strategically Pakistan location is the only state which gives China, Iran to a haven for its international trade with the Central Asian, Gulf and European state, even all over the world (Mark, 2014). However, very limited empirical studies have been addressing this research question. We overwhelm this gap by take into account infrastructure indicators in empirical framework to elaborate countries logistic systems sufficiency and enhance more trade and particularly in industrial countries and even to oil exporting region that are more reliant on logistic services. An increasing trend is observed indicating a higher degree of trade openness between Pakistan and China. Pakistan export has been increased by 6% in 2015 in comparison with year 2010. The recent trend of Pakistan share in China's exports and imports from 2010 to 2015 is illustrated in Figure 1. Exports share follows a steady increasing trend while import share remains same expect in 2012. It reveals that China prefers to exports rather than imports from Pakistan.

The present study is systematized as follows: The next section explains the Literature Review. Section 3 presents the specification of the Pakistan and China Regional Trade in the context of CPEC. The methodology and empirical strategy summarizes the main results in Section 4. The last section summarizes the paper and outlines the policy implications.

Figure 1: Pakistan Export Share in China's Exports and Imports
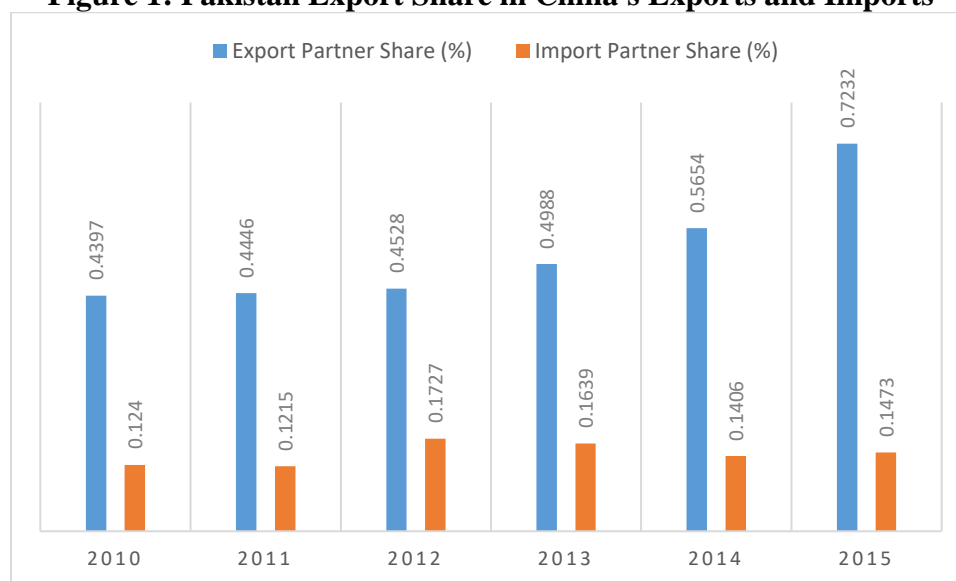
Source: Compiled from World Integrated Trade Solution, 2015

Literature Review

Prior literature is organized by various researchers to investigate link to exports, imports, transport both in developed and developing countries. Greenaway et al (2008) used Panel data of 86 regions for the period of 1988-2005 and employed gravity model, to evaluate the France, United States and Chinese imports on manufacturing exports of Sub-Saharan Africa. The empirical findings conclude that Chinese imports push up the Sub-Saharan African exports in all sectors as compared to France and United States. Blyde and Molina (2015) casual evidence suggests that sufficient logistics and transport infrastructure to pinpoint associates that contribute in cross-border production sharing. They found that distance is an imperative element providing provision to the networking; it is the key of international production networks. These results are also in line with the findings of Hummels et al., 1998.

Jacks et al. (2011) answered the question, what has driven trade booms and trade busts in the past and current? They constructed a new sample of bilateral trade flows using gravity model for 130 country pairs across the Asia, America, Europe, and Oceania for the period span from 1870 to 2000 and demonstrated an prevailing role for declining trade costs in the pre-World War I trade boom, it means; it was the period of the globalization. In contrast, for the post-World War 2 trade boom, a change in output as the overriding force has been identified. Over the last 50 years, trade has increasingly sustainability in its growth due to economic expansion, and this process seems to have had a bigger impact than the transportation and communications uprising of the last few decades. Finally, the sum of the interwar trade bust is explained by increases in trade costs. In short, Trade becomes more susceptible through a trade costs (Yi, 2003). Prabir (2006) emphasized on transport infrastructure and transaction costs to access markets and trade. The paper carried out the link between regional trade flows and trade cost, particularly in context of Asia. The findings spotlighted that transaction cost is key determinant and prime hurdle in the way of regional trade integration.

Francois and Miriam (2013) elaborated trade patterns along institutional quality and infrastructure level. The study concluded that modern infrastructure and institutional superiority are mainstream drivers of regional trade. The new emerging globalizer's countries have seen rapid growth in trade, and this growth has been linked to accelerating growth rates, pushing incomes on a catch-up path with the OECD and driving poverty rates down in the process (Sala-i-Martin, 2006). On the other hand, there is quite unalike story of African developing nations to share. In the behind of this story infrastructure and institutional quality is very clear emphasizing. The empirical estimates explored that developing nations pay attention towards market access but not providing enough support for trade.

In short, Modern literature focusing on trade supports the interpretation that modern infrastructure can foster trade. The literature also validates argument on infrastructure and its impact on trade. Limao and Venables (2001) found that total transport costs can be determined by infrastructure. The findings explored that poor infrastructure accounts for 40% of predicted transport costs for coastal countries and up to 60% for landlocked countries. In line of gravity models, Bougheas et al. (1999) also give the empirical proof from European countries linking infrastructure to transport costs and trade. Wilson et al. (2005) have employed the key variables indicators on trade facilitation; ports, customs, regulations, and e-business which are key for all types of trade. Focusing on logistics infrastructure, Behar et al. (2009) concludes that logistics could increase exports by about 46% for an average-size developing country.

Pakistan and China Regional Trade in the context of CPEC

The Vision "2025" calls for regional connectivity, not only through the CPEC, but also through other such planning with regional and all over the world. Pakistan's location at the heart of Central Asia, South Asia, Gulf region, African and West Asia makes it ideally suited for inter-regional trade. CPEC bringing a mutual prosperity into the two countries. CPEC and Lahore-Karachi Motorway also plan of Pakistani government, will take a new living sign in the region of Punjab. Vision "2025" is a dream of Pakistan and CPEC is an infrastructure developed is a first step to this vision. Pakistan and china export prices will reduce and demand will grow for European and even African and Middle Eastern countries. It is golden chance for Pakistani economy to coverage agriculture and industrial product to world market at low cost.

CPEC will pace up transportation through a road network. It will also reduce distance (within China Kashghar, 4376 km away from Beijing; the Persian Gulf from 13000 km to 2500 km; Eastern Europe from 31089 km to 15595 km), shipping cost and time (the Persian Gulf from current 45 days to just 10 days) as well as from China to Asian, Gulf, African and Eastern Europe countries. This will help regional trade and accelerate economic development. In short, it will save distance 10600 Km from china to Persian Gulf and 6224 Km from Beijing to Persian Gulf. China as second more oil user after USA, will save 15494 km in totality through CPEC. This will reduce the logistic cost of all the cost indicators such as, insurance, time, fuel, custom duties, labor cost, port charges, ocean freight, and taxes. Through CPEC, China will access to the Indian Ocean and the Middle East to sustain petroleum, oil and raw material supplies i.e. "the route can also serve as an alternative to the Malacca straits, which China currently uses to access the Middle East, Africa and Europe". China's 70% of oil needs will have met through the Strait of Malacca and Indian Ocean. This high level of dependence on this route will make possibility of energy availability. It is future necessary demand of china, not only china but all china trading partners.

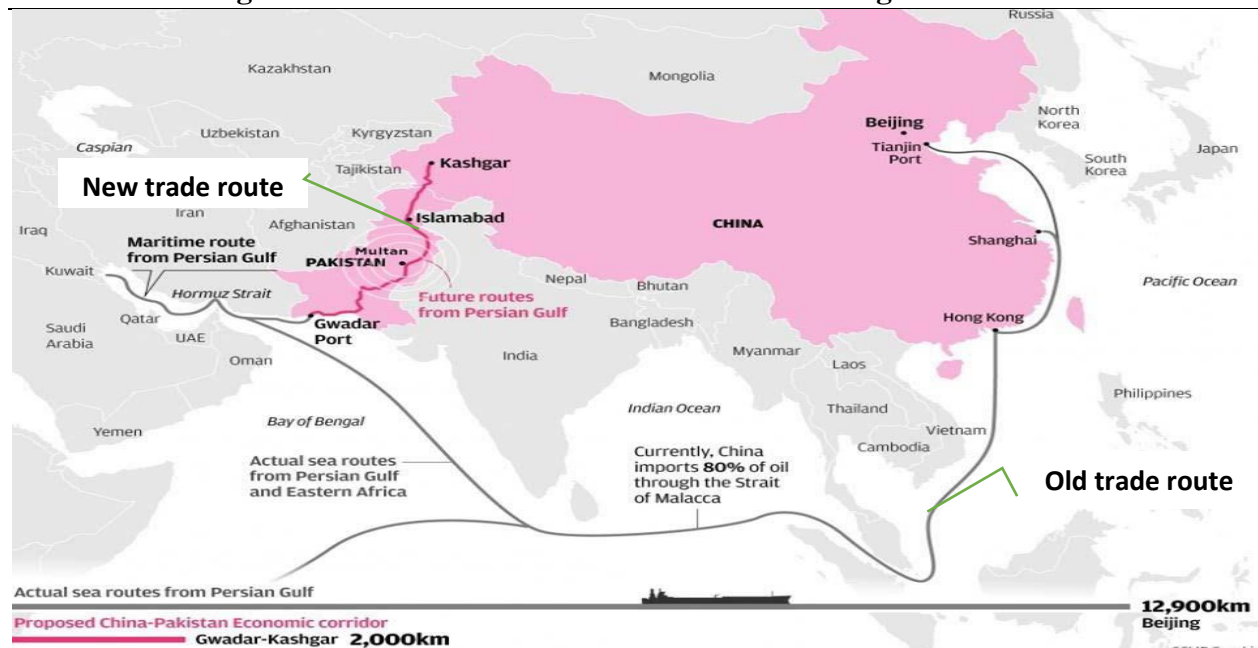**Figure 2. Old and new trade route from china to gulf countries**

Figure 3 illustrates the patterns of Chinese economy with respect to exports, imports and GDP. It reflects the recent China position around the globe. Chinese share of GDP, exports and imports are calculated from world GDP, world exports and imports respectively. The Chinese economy is growing rapidly as its GDP share in world GDP increased from 2000 to 2016. GDP share in world GDP is five times in 2016 as compared to 2000. Exports and imports share also follow an increasing trend over the time while exports share always remains greater then import share.

Figure 3: China Share around the Globe
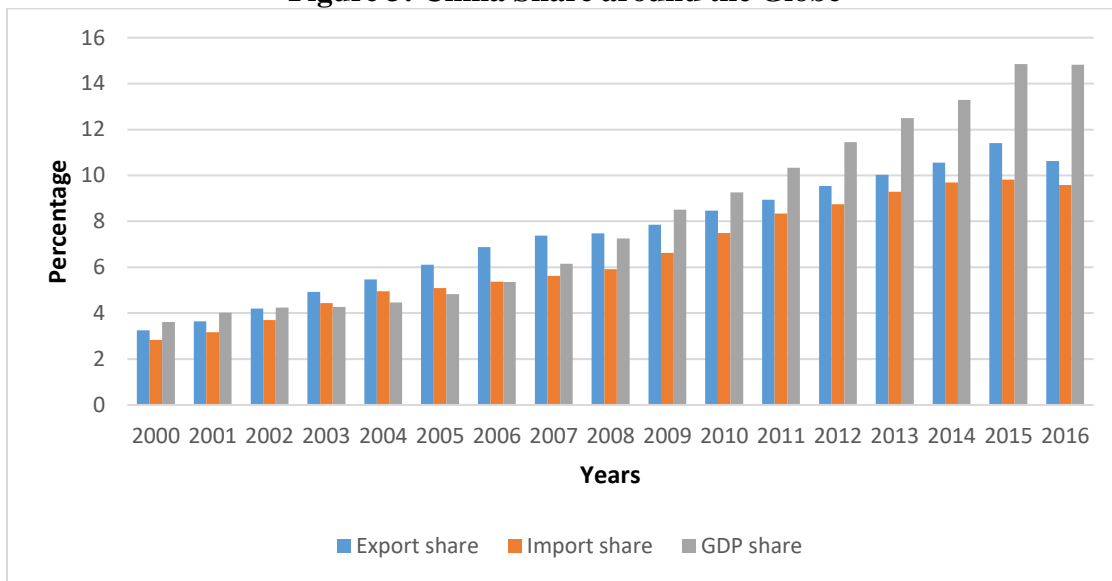
Source: compiled from World Development Indicators, 2016

Chinese economy is grasping share from all over the world due to sustainable growth. Figure 4 illustrates the recent regional trade patterns of Chinese economy. East Asia and Pacific regions are major trading partner of Chinese economy which is providing health signals to Pakistani economy to grow under the canopy CPEC. Europe & Central Asia and North America are second and third respectively in trading with China across the globe. So, CPEC is crucial driver to enhance the regional trade flow and development. It also will trigger the trade flow especially in South Asia, Middle East and North Africa.

Figure 4: China Regional trade, 2015-16
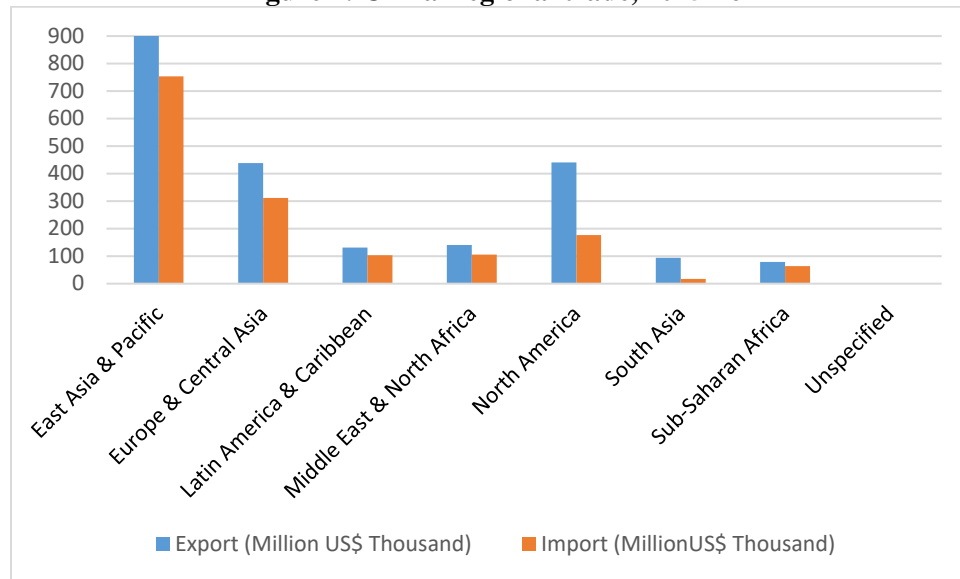
Source: compiled from world integrated trade solution, 2015-16

Methodology and empirical estimation

Empirical strategy is twofold, first is forecast base and second is based on estimation. The datasets used for estimation which is exports, imports, GDP of China and World respectively are extracted from World Development Indicators (WDI) that is given by World Bank. The data on available twenty one sectorial exports and imports among China and Pakistan is collected from world integrated trade solution. World integrated trade solution dataset provides the exports and imports with all trading partners of specific country.

Geographic information system

The shortest route among two location linked with roads, can be measured through Geographic Information System (GIS) North American Network Model. This approach measures the average speed for each part of network as per regional location, administration, toll status and its hierarchy. Now in that case what happened to Pakistani transportation cost, no doubt it will remove, we can have measured the physics formula: such as,

$$Average\ speed = \frac{Distance}{Time} \ldots \ldots .. (1)$$

By utilizing the GIS North American Network Model, time consumption and saving estimated before and after CPEC Length of road infrastructure projects among Pakistan and China. The results are demonstrated in Table 1. It elaborates the CPEC road infrastructure and its effect on average speeds.

Table1: GIS estimation CPEC

Total Length	Average speed			Average speed		
2400 km	**Before corridor**	**Time consuming**		**After corridor**	**Time consuming**	**Time saving**
	30 kmh⁻¹	80 hr		60 kmh⁻¹	40hr	40hr
	40 kmh⁻¹	60 hr		80 kmh⁻¹	30hr	30hr
	50 kmh⁻¹	48 hr		100 kmh⁻¹	24hr	24hr

Source: Own Calculations based on the GIS North American Network Model

As we know that the variable cost depends on the time and distance, it increases with passage of distance. Labor, maintenance, repair, tire consumption, fuel and labor costs constitute 82% of variable transportation costs, and consequently, transportation cost is directly affected fluctuations in fuel price and labor cost. For example, the price of diesel increased 100% from 2003 to 2011 (US Energy Information Administration, 2009), in that case very highly pressure on trade. Such as an upsurge significantly impacts on transportation costs. Fixed transportation cost is a function of truck utilization (Berwick and Dooley, 1997). After the CPEC made more number of trips in short time, in sum, fixed transportation costs increase with the increase of loading/unloading time since the charge out rate of transportation companies is made on an hourly basis. Each extra hour increases more transportation costs that are good sign for the Pakistan and even for china trade. Based on our different average speed, it is assumed that the transportation costs will be reducing after the completion of CPEC.

CPEC Trade Potential for Pakistan

In line of, we utilized measures of concentration level and intra-industry trade rate as proxy of intra-regional trade to examine the impact of such economic flow on the general trade in the region. Concentration ratio (CR) used to measure the concentration level, while Grubel-Lioyd index (GL) applied to calculate intra-regional trade with intra-industry trade rate. It was announced by Grubel and Lioyd (1971) first time in international trade. It measure concentration level of trade of one country with respect to other country by following mathematical notation.

$$CR = \left(\sum_{i=1}^{k} P_{it} \right) * 100 \ldots \ldots (2)$$

In equation 2, $P_{it} = \frac{q_{it}}{q}$, q_{it} is exports or imports of country "i" in time period "t" and q is sum of all countries exports. The trade potential results of CPEC are reported in Table 2. The results of CR elaborate the high level of concentration of exports categories in all products; Capital goods, Consumer goods, Intermediate goods, Machine and Electronics, Metals and Textiles and Clothing. According to CR all products; Intermediate goods, Machine and Electronics, Capital goods and Consumer goods are ranked 1st, 2nd, 3rd, 4th and 5th respectively.

The aforementioned five exports categories have still regional trade potential because these categories have more concentration level than other seventeen export categories. The results

demonstrates that five out twenty one export categories have low trade concentration level and potential for regional trade which is an indication of mutual benefits in term of investment, trade and job creation. Intra-regional trade rate is measured by using GL index. China is a strong and major stockholder as compared to all CPEC related countries. So, we take China as benchmark to compute GL index. The GL index has range 0 to 1. If a country's index values close to 1 then it demonstrates the higher rate of intra-industry trade rate for sector "i" in time period "t".

$$GL_{it} = 1 - \frac{|X_{it} - M_{it}|}{X_{it} + M_{it}} \dots \dots (3)$$

In equation 3, X_i is exports of country "i" to benchmark country while M_i is imports from benchmark country. On the other side, GL index elaborates the interesting empirical outcomes in term of intra-regional trade rate. The results of GL index bifurcated into three categories; low intra-regional trade rate 0 to 0.6, medium intra-regional trade rate 0.61 to 0.80 and high intra-regional trade rate 0.81 to 1.00. The results of low intra-regional trade rate in all products, Capital goods, Consumer goods, Intermediate goods, Animal, Chemicals, Footwear, Fuels, Machine and Electronics, Metals, Minerals, Miscellaneous, Plastic or Rubber, Stone and Glass, Transportation and wood categories; medium intra-regional trade rate in Raw materials, Food Products and Textiles and Clothing categories. Whereas, the empirical findings depicts the high intra-regional trade rate in Hides and Skins, and Vegetable categories. The results also show that Chinese economy is more competitive in most of exports categories as compared to Pakistani economy. Pakistan is only competent to China in Vegetable, Hides and Skins, Food Products, Raw materials and Textiles and Clothing. It reflects that Pakistan is more competent in agricultural based exports categories and cannot compete in industrial export categories.

Table 2: CPEC Trade Potential (2015-16) for Pakistan

	Benchmark	China	
	Partner Name	Pakistan	
Case	Export category	CR	GL index
1	All Products	**86.72**	0.261
2	Capital goods	**26.28**	0.001
3	Consumer goods	**25.16**	0.108
4	Intermediate goods	**34.47**	0.447
5	Raw materials	0.793	**0.656**
6	Animal	0.003	0.026
7	Chemicals	8.440	0.001
8	Food Products	0.420	**0.751**
9	Footwear	2.478	0.007

10	Fuels	0.080	0.007
11	Hides and Skins	0.699	**0.934**
12	Machine and Electronics	**26.98**	0.003
13	Metals	**11.24**	0.137
14	Minerals	0.036	0.086
15	Miscellaneous	4.819	0.034
16	Plastic or Rubber	4.784	0.057
17	Stone and Glass	3.275	0.004
18	Textiles and Clothing	**17.90**	**0.636**
19	Transportation	2.062	0.410
20	Vegetable	1.224	**0.994**
21	Wood	2.254	0.001

Source: Own Calculations

Conclusion and policy implication

In current study, we have made effort to investigate trade poetical for Pakistani economy as compared to major stakeholder China. For this purpose, we utilized the GIS network model to measure speed, time consuming and saving before and after the CPEC. CR and GL index are used to sectorial trade potential and intra-regional trade rate respectively. The empirical findings from GIS network model, conclude that CPEC will reduced one half shipping time as compared to time consuming without CPEC project. It also concluded that there is high level of concentration of exports categories in All Products, Capital goods, Consumer goods, Intermediate goods, Machine and Electronics, Metals and Textiles and Clothing sector respectively. On the other hand, intra-regional trade rate affirmed that Pakistan is only competent to China in Vegetable, Hides and Skins, Food Products, Raw materials and Textiles and Clothing. It reflects that Pakistan is more competent in agricultural based exports categories and cannot compete in industrial export categories. In light of empirical findings, the study proposes few policy recommendations, for instance, high concentration exports may be upgrade to get fruit of CPEC and compete with Chinese economy as well as. The intra-regional trade rate results depict that CPEC also increases the market potential for Pakistan's exports to China in the field of agricultural products, textile, and minerals, in addition boost up to tourism in the northern reaches of the country.

In context of policy implication, authorities and policy makers must be synchronized tax policies and subsides regarding capital and consumer goods, metals and textiles sectors. Furthermore, the intra-regional trade rate estimation indicate that Pakistani economy needed to devise tax policy, tax-free zone and subsides for industrial development to compete Chinese industrial exports. This corridor is the dream of globalizer who supported the international trade as well globalization. CPEC connect all over the world in a single line. The authorities and policy makers must be purse to government to be signed a free trade agreement with other partner's country. Proper provision

of safety and security, as well as law and order require being world-class. This corridor provides a new wave of safety and security that is a big assignment for Pakistani government.

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